

In the Drawings:

The attached sheets of drawings include added new Figs. 3A and 3B. Figs. 3A and 3B illustrate embodiments of a heat spreader mounted onto a PCB substrate or stiffener using an adhesive.

REMARKS

This is a full and timely response to the outstanding non-final Office Action mailed March 25, 2005. Upon entry of the amendments in this response, claims 25-37, 41-53 and 57-62 remain pending. In particular, Applicant has amended claims 25 and 25, 36 and 41, and has cancelled claims 30 and 46, without waiver, disclaimer or prejudice. Applicant has canceled claims 30 and 46 merely to reduce the number of disputed issues and to facilitate early allowance and issuance of other claims in the present application. Applicant reserves the right to pursue the subject matter of these canceled claims in a continuing application, if Applicant so chooses, and does not intend to dedicate the canceled subject matter to the public. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

Indication of Allowable Subject Matter

The Office Action indicates that claims 30 and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent from including all the limitation of the base claim and any intervening claims. As set forth above, Applicant has amended independent claims 25 and 41 to recite features that are believed to be the bases for the stated allowability of original claims 30 and 46. Therefore, Applicant respectfully asserts that claims 25 and 41, as well as there respective dependent claims 26-29, 31-37, 42-45, 47-53, also are in condition of allowance.

Objections to the Drawings

The Office Action indicates that the drawing are objected to under 37 C.F.R. 1.83(a). In this regard, Applicant respectfully submits herewith a sheet of drawings including Figs. 3A and 3B to be entered in the application. Figs. 3A and 3B illustrate embodiments of a heat spreader mounted onto a PCB substrate or stiffener using an adhesive, as previously described in the specification and recited in the original claims. Therefore, Applicant respectfully asserts that no new matter has been added.

Objections to the Claims

The Office Action indicates that the claims 25 and 36 stand objected to because of misspellings. As set forth above, Applicant has amended the claims and respectfully asserts that the objection has been accommodated.

Rejections under 35 U.S.C. 103

The Office Action indicates that claims 25 and 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Juskey* in view of *Khatri*. The Office Action also indicates that claims 26, 27, 34 and 35-37 stand rejected under rejected under 35 U.S.C. 103(a) as being unpatentable over *Juskey* in view of *Khatri* and further in view of *Long*; that claim 25 stands rejected under 35 U.S.C. 103(a) as being unpatentable over *Juskey* in view of *Khatri* and further in view of *Culnane*; that claim 31 stands rejected under 35 U.S.C. 103(a) as being unpatentable over *Juskey* in view of *Khatri* and further in view of *Eguchi*; that claims 32 and 33 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Juskey* in view of *Khatri* and further in view of *Primeaux*; that claims 41 and 42 stand rejected under 35 U.S.C. 103(a) as being unpatentable

over *Juskey* in view of *Khatri* and further in view of *Lee*; that claims 42, 43, 50 and 51-53 stands rejected under 35 U.S.C. 103(a) as being unpatentable over *Juskey* in view of *Khatri* and in view of *Lee* and further in view of Long; and that claim 44 stands rejected under 35 U.S.C. 103(a) as being unpatentable over *Juskey* in view of *Khatri* and in view of *Lee* and further in view of *Culnane*. Additionally, the Office Action indicates that claim 47 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Juskey* in view of *Khatri* and further in view of *Eguchi* and that claims 48 and 49 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Juskey* in view of *Khatri* and in view of *Lee* and further in view of *Primeaux*. Applicant respectfully traverses the rejections.

With respect to claim 25, that claim now recites:

25. A heat spreader ball grid array package, comprising:
a ball grid substrate;
a semiconductor chip affixed to the ball grid substrate;
a mounting compound encasing the semiconductor chip over the ball grid substrate;
a heat spreader mounted over the ball grid substrate and spaced apart from the molding compound to form a gap; and
thermal grease within the gap at least between the heat spreader and the molding compound, wherein the thermal grease comprises silicon rubber containing heat-conducting particles, epoxy resin, curing agent, a catalyst, a coupling agent, a filler, a flame retardant, a mold-release agent, a coloring agent and a stress-relief agent.

(Emphasis Added).

Applicant respectfully asserts that the recited references, either individually or in combination, are legally deficient for the purpose of rendering claim 25 obvious. Specifically, Applicant respectfully asserts that none of *Juskey*, *Khatri*, *Long*, *Culnane*, *Eguchi*, or *Primeaux* teaches or reasonably suggests at least the feature/limitations emphasized above in claim 25. Therefore, Applicant respectfully asserts that claim 25 is in condition for allowance. Since

claims 26-29 and 31-37 are dependent claims that depend from claim 25 either directly or indirectly, Applicant respectfully asserts that these claims also are in condition for allowance.

With respect to claim 41, the claim now recites:

41. A heat spreader ball grid array package, comprising:
a ball grid substrate;
a semiconductor chip affixed to the ball grid substrate;
a molding compound encasing the semiconductor chip over the ball grid substrate;
thermal grease over the molding compound, wherein the thermal grease comprises silicon rubber containing heat-conducting particles, epoxy resin, curing agent, a catalyst, a coupling agent, a filler, a flame retardant, a mold-release agent, a coloring agent and a stress-relief agent;
a heat spreader mounted over the ball grid substrate, the molding compound and the thermal grease; and
a PCB substrate or a stiffener mounted to the heat spreader.

(Emphasis Added).

Applicant respectfully asserts that the recited references, either individually or in combination, are legally deficient for the purpose of rendering claim 41 obvious. Specifically, Applicant respectfully asserts that none of *Juskey, Khatri, Lee, Long, Culnane, Eguchi*, or *Primeaux* teaches or reasonably suggests at least the feature/limitations emphasized above in claim 41. Therefore, Applicant respectfully asserts that claim 41 is in condition for allowance. Since claims 42-45 and 47-53 are dependent claims that depend from claim 41 either directly or indirectly, Applicant respectfully asserts that these claims also are in condition for allowance.

Cited Art Made of Record

The cited art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

No fee is believed to be due in connection with this amendment and response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

By:



Daniel R. McClure
Registration No. 38,962

Thomas, Kayden, Horstemeyer & Risley, LLP
100 Galleria Pkwy, NW
Suite 1750
Atlanta, GA 30339
770-933-9500